# WELL SUMMARY

Location ID: ST-4-589 Field Representative(s): M. Canavan, D. Menzie

Date Started: 05/06/92 Date Completed: 05/21/92

Northing: 232223.95 Easting: 400481.62

Brass Cap: 4494.13 Outer Casing: 4494.18 Inner Casing: 4494.69

Drilling Method: Mud/Air Foam Rotary Drilling Contractor: Larjon Drilling Co.

Driller: J. Gower

Total Depth Borehole: 610' Total Depth Well Casing: 604.0

Total Depth Surface Casing: 82'

Diameter Well Casing: 4" Diameter Surface Casing: 10"

Length of Bottom Blank: 5.25'

Type of Screen: extra strength 0.02 slot

Screen Interval: 588.75' to 598.75'

Water First Detected: 485' Water Level Open Borehole: 422.92'(T.O.S.C.) 05/14/92

Water Level Cased Borehole: 425.26' (T.O.C.) (05/18/92)

Quik-Foam Use:

Estimated Water Use: 9,600 gallons

Well Casing:

4in x 3ft SCD 40 PVC:
4in x 5ft SCD 40 PVC:
4in x 10ft SCD 40 PVC:
4in x 20ft SCD 40 PVC:
Total SCD 40 PVC pipe: ft

custom SS centralizers:
4"x2' SS locking riser: 1 set
4" SS locking cap: 1
4" SS female cap: .26'
Adaptor(s): .58'

4in x 3ft SCD 5 SS pipe: 1 (cut to .41')
4in x 5ft SCD 5 SS pipe:
4in x 10ft SCD 5 SS pipe:
4in x 20ft SCD 5 SS pipe: 20'
Total SCD 5 SS pipe: 400.27'

4in x 5ft SCD 10 SS pipe: 1
4in x 10ft SCD 10 SS pipe: 1
4in x 20ft SCD 10 SS pipe: 9
Total SCD 10 SS pipe: 195.01'

Well Completion:

| | | |
|---|---|---|
| 100# bags 16/40 sand: | 22 | bags |
| 100# bags 8/20 sand: | 42.5 | bags |
| 94# bags cement: | 150 | bags |
| 50# bentonite powder: | 15 | bags |
| Benseal: | 1 | bags |
| 100# bags #3 sand: | 20 | bags |

Surface Casing:

| | | |
|---|---|---|
| 94# bags cement: | 45 | bags |
| 50# bags bentonite powder: | 4 | bags |

Pertinent Field Notes:

| | |
|---|---|
| 05/06/92 | Steam cleaned and mobilized Frank's rig to site. Set up to drill, mixed mud (900 gallons water) and spudded hole. Drilled pilot hole 0'-44'. - Canavan |
| 05/07/92 | Drilled pilot hole 44'-85'. Reamed pilot hole 0'-85'. - Canavan |
| 05/08/92 | Ran 82' of surface casing and grouted it into place. - Canavan |
| 05/11/92 | Demobilized Frank's rig and mobilized BE to site. Set up to drill air foam. |
| 05/12/92 | Drilled 85'-385' with air foam rotary. Used 3,800 gallons water. |
| 05/13/92 | Drilled 385'-610' (TD). - Canavan |
| 05/14/92 | Southwest Surveys ran full suite of geophysical logs. Poured filler sand and pumped bottom plug. - Canavan |
| 05/15/92 | Sounded top of bottom plug at 597.83'. Installed casing. Bottom of sump is at 604.00' and screened interval is 588.75'-598.75'*. Installed gravel pack and pumped top plug. - Canavan |
| 05/18/92 | Sounded top of plug at 566.75' and water level at 425.26' (T.O.C.). Poured filler sand from 566.75'-403.1'. Poured first load of grout (50 sacks, 5 gel)*. - Canavan |
| 05/19/92 | Poured second load of grout. Bailed well 20 x 110 gallons to begin development. Installed 1½ HP pump for development. - Canavan |
| 05/20/92 | Pumped well for final development. 1050 gallons pumped (1160 total discharged). Parameters stabilized (see development sheet for details). Pulled pump and turned well over to Lockheed. - Menzie |

*see attached explanation

ST-4-589 Installation

During the installation of this well, two errors occurred which resulted in this well being "out of norm" from other NASA monitor wells. In-spite of errors made during this installation, the well developed normally and is a good producer.

On 05/14/92, filler sand was poured from 606.83' (top of slough; TD = 610') to 601.83'. A bottom plug was pumped (601.20'-597.83') and 16/40 sand was installed on top of the plug (597.83'-594.25'). A sump, screen and 10' joint of SCH 10 casing was installed. Then, erroneously, 60' of SCH 5 casing was installed instead of SCH 10. After reviewing options, it was decided that rather than pulling the SCH 5 pipe (risking galling the pipe and rendering it useless), it would be installed as was. Care was taken not to exceed the SCH 5 collapse strength and remainder of casing was installed as planned. (see completion diagram).

While tallying pipe to set the screen at the correct interval, the 10' joint installed above the screen was overlooked. Consequently, the gravel pack was installed as though the screen was from 579'-589'. (see completion diagram). The true screen interval is 589'-599'.

Although the screen and gravel pack are not aligned per the usual NASA well installation protocol, the well developed quickly and is a good producer as expected.